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POULTRY MARKETING STUDIES

I. Factors in the Preparation of Fryers and Roasters for Market

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DEPARTMENT OF POULTRY HUSBANDRY
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I. Factors in the Preparation of Fryers and Roasters for Market

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INTRODUCTION

There is increasing interest in poultry marketing in Hawaii. Local consumers have seen improved packaged poultry shipped in from the Mainland, and, if this study is any guide, have established a preference for eviscerated birds provided the price is reasonable. Poultrymen have also become increasingly interested in this trend. From the greater number of locally packaged chickens, it can be assumed that there is a tendency to adopt these methods in order to compete for the market. Since there is limited local information on the time required to dress and eviscerate chickens, it has not been possible to answer questions that have been raised regarding the costs incurred in the preparation of eviscerated and packaged poultry. Furthermore, in eviscerating or sectioning chickens there are losses in salable carcass that must be accounted for in the sales price of the packaged product. Rosenberg *et al.* (4) had published a preliminary report, but it was not known whether the losses due to dressing, eviscerating, and sectioning poultry according to local methods were comparable to those obtained in numerous mainland investigations. This report has been prepared to provide the territorial poultryman with reference standards that he may apply in arriving at a fair price for his dressed, eviscerated, or sectioned chickens.

The tables included in this paper were based on chickens whose average live body weights ranged from 4.11 to 5.34 pounds, per lot. These birds were reared at the University of Hawaii poultry farm, and were killed and dressed by farm personnel. The methods employed in processing the chickens for market were patterned after local practices so as to provide pertinent data both for marketing losses and labor required for each method. A preliminary study was also made of consumer preferences for dressed, eviscerated, and sectioned chickens. The three classes of market poultry were offered for sale to the faculty and employees of the University of Hawaii. Buyers were asked to fill in a questionnaire. From these replies somewhat tentative conclusions have been derived regarding consumer preferences for local market chickens.

MATERIALS AND METHODS

Records have been compiled on 562 chickens of which 187 were females. The number of birds per group, their ages, and body weights at time of

slaughter are shown in table 1. Since these groups did not come from a single hatch and were fed various experimental rations, body weights on the basis of age are not comparable. With the exception of group 2 (R.I.R. x N.H.) the experimental birds were standard-bred New Hampshires. All the groups, with the exception of group 2 (starved 16 hours), were on full feed until slaughtered. They all received standard grower rations in which not over 30 percent of the feed consisted of cracked corn and whole wheat.

The procedure for killing and dressing the birds was the same for each group. The birds were shackled individually and bled by means of the internal stick; that is, by inserting the tip of a sticking knife into the esophagus with the cutting edge turned toward the roof of the mouth and cutting across the jugular veins. The birds were handled in groups of 15, and body weight measurements as well as time spent were recorded during each stage of dressing, eviscerating, and sectioning the birds. No attempt was made to work at maximum speed. The chickens were "roughed" and then immersed for 30 to 45 seconds in water heated to 130° F. They were then rubbed on an automatic picking machine and pinned by hand. At this point the birds were considered to be New York dressed.

Eviscerated birds were handled in the following sequence: The shanks and feet were removed by cutting across the joints at the hock (where the shank meets the feathered portion of the leg). The oil sac at the base of the

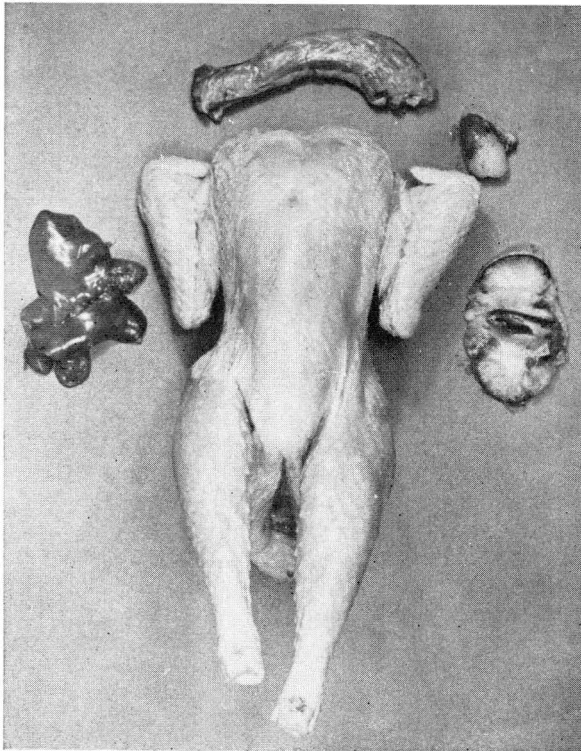


Figure 1. An eviscerated chicken showing the edible portions that are inserted in the carcass.

Figure 2. The same eviscerated chicken when placed in a transparent wrapper.



tail was then removed. Using a sharp knife, a longitudinal cut was made along the entire length of the back adjacent to the backbone, and the carcass was opened like a book. All internal organs were removed and only the heart, liver, and gizzard were retained. The gizzard was opened and its contents and inner lining removed, while the heart was opened and washed free of blood. The gall bladder was carefully severed from the liver and discarded. The neck was cut away from the backbone at the shoulder, and the head and skin were then removed. All edible parts were thoroughly washed and drained (figure 1). The gizzard, heart, liver, and neck were placed within the body cavity and the eviscerated carcass was weighed and wrapped (figure 2).

When drawing sectioned birds a modified procedure was followed. After the shanks and oil sac were removed, the neck was severed at the shoulders. The head and adjoining skin were then removed; the crop, windpipe, and gullet were freed and discarded. A vertical incision was made on the abdomen and continued around the vent. The connecting tissues supporting the viscera were torn by inserting the fingers into the incision, and all entrails and edible

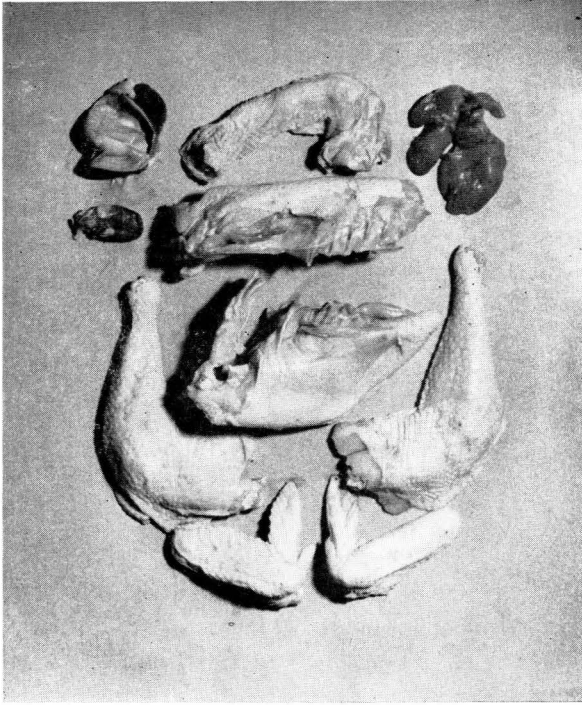


Figure 3. A sectioned chicken showing the salable portions that are packaged.

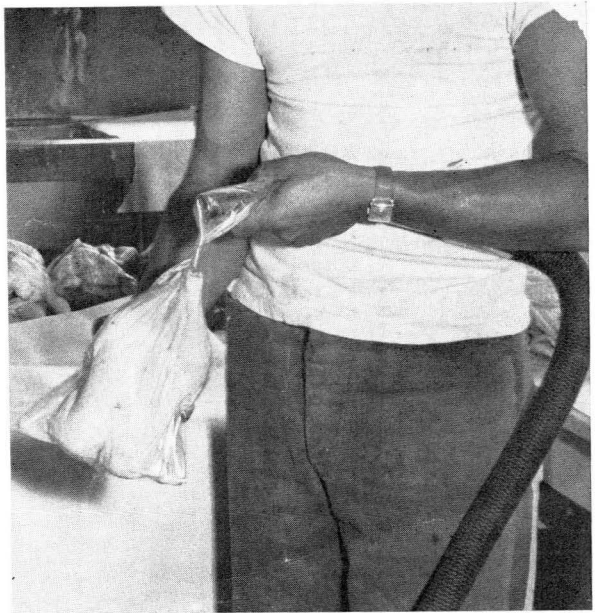


Figure 4. The transparent wrapper is snug against the bird, the air having been removed by a vacuum cleaner.

organs were removed. The legs were severed at the hip joint. The wings were removed by cutting through the flesh at the joint, starting at the underwing crease. Lateral cuts were made through the ribs so as to separate the breast from the backbone. The liver and heart were cleaned as indicated above. When wrapped and weighed, the following pieces were enclosed in a transparent wrapper: breast, backbone, two wings, two legs, gizzard, heart, liver, and neck (figure 3).

Air was removed by means of a vacuum cleaner as the wrapper was patted against the carcass. Finally the package was revolved several times and tied (figure 4). Other information on dressing and drawing chickens has been prepared by Bice (1) and Fenton *et al.* (2).

RESULTS

The losses due to dressing, eviscerating, and sectioning chickens of different weights are shown in table 1. The percentage of live weight lost in dressing was very similar among the male groups, but was somewhat less for the females. For all birds slaughtered in this study the average dressing loss was 9.3 percent of total body weight. The percentage of live weight lost through evisceration varied in accordance with body weight, the lightest birds losing 24.0 percent and the heaviest birds losing 33.0 percent. Similarly, the percentage loss from dressed weight due to evisceration varied with initial body weight, ranging from 17.3 to 25.9 percent. When the initial live weight of group 2 birds was considered, instead of the starved weight, then the percentage loss due to evisceration was increased from 25.7 to 30.5 percent. The percentage loss due to sectioning was a little higher than for evisceration. For example, in the group 4 males the loss due to sectioning, based on live weight, was 1.3 percent greater than for evisceration.

TABLE 1. Body weight losses due to dressing, eviscerating, and sectioning

GROUP NO.	NO. OF BIRDS	AGE	SEX	AVERAGE LIVE WT. BEFORE SLAUGHTER	LIVE WT. LOST IN DRESSING	PERCENTAGE LOST AFTER EVISCERATION		PERCENTAGE LOST AFTER SECTIONING	
						From live weight	From dressed weight	From live weight	From dressed weight
		<i>weeks</i>		<i>pounds</i>	<i>percent</i>				
1	187	17	Females	4.11	8.52	23.90	17.33	26.84	19.29
2	71	14	Males	4.17*	9.50	25.66	17.87	.....	.....
3	73	14	Males	5.13	9.95	27.30	19.27	.....	.....
4	231	16	Males	5.34	9.56	32.96	25.88	34.27	27.33

* Birds starved 16 hours prior to slaughter. Original weight 4.46 pounds.

The time required to dress, eviscerate, section, and package poultry for market is shown in table 2. According to this study an average time of 6.7 minutes was required to dress, 10.5 minutes to eviscerate and package, and 14.2 minutes to eviscerate, section, and package the experimental birds. Based on an estimate of \$1.00 per hour the labor costs would be as follows: 11.1 cents to dress; 17.5 cents to dress, eviscerate, and package; and 23.7 cents to dress, eviscerate, section, and package a bird. These labor costs are based on the local method of preparing poultry for market.

TABLE 2. Time required to dress, eviscerate, section, and package poultry for market

JOB	STUDY 1	STUDY 2	STUDY 3	X SECONDS PER BIRD
	<i>seconds</i>	<i>seconds</i>	<i>seconds</i>	
Prepare to kill	7.6	1.6	1.1	3.43
Killing operations	45.9	35.7	39.0	40.20
Transport birds to dressing room . .	8.3	10.5	8.2	9.00
Prepare to dress	4.1	3.3	3.0	3.47
Scald and pluck	79.8	88.9	76.6	81.80
Pin and plump	237.6	137.0	97.8	157.40
Rinse, drain, and weigh birds . . . .	....	96.6	112.3	104.45
Total				399.75 = 6.7 minutes
Time to dress . . . . .	....	....	....	295.30
Prepare to eviscerate	8.9	7.1	8.5	8.17
Eviscerate	188.3	169.4	179.2	178.97
Weigh, package, and mark . . . . .	....	146.0	148.9	147.45
Clean up	23.9	15.2	17.2	18.77
Total				629.89 = 10.5 minutes
Time to dress . . . . .	....	....	....	295.30
Prepare to section	8.9	7.1	8.5	8.17
Section . . . . .	....	355.5	323.5	339.50
Weigh, package, and mark . . . . .	....	198.2	186.5	192.35
Clean up	23.9	15.2	17.2	18.77
Total				854.09 = 14.2 minutes

In the consumer preference study a total of 305 chickens were purchased by the faculty and employees of this University. The prices established for this study were as follows: 57 cents per pound New York dressed; 74 cents per pound eviscerated and packaged in a transparent wrapper; and 79 cents per pound sectioned and packaged in a transparent wrapper. The results of this study may be seen in table 3. Of all birds sold, 25.6 percent were New York dressed, 49.5 percent were eviscerated and packaged, and 24.9 percent were sectioned and packaged. Only one bird per buyer was allowed in this study.

TABLE 3. A summary of consumer preference for differently processed chickens

DATE	TOTAL SOLD	NEW YORK DRESSED	EVISцерATED AND PACKAGED	SECTIONED AND PACKAGED
March 2, 1950	165	44	85	36
March 9, 1950	140	34	66	40
Total	305	78	151	76
Percentage of total		25.6	49.5	24.9

Each customer was asked to answer a questionnaire in which the questions dealt with preferences on age of market poultry, geographical site of production, frequency of purchase, and size of family. Two hundred and thirty-five questionnaires were returned. As may be seen in table 4, 88.9 percent declared a preference for young market birds. The predominant preference was for

TABLE 4. Consumer preference for classes of poultry

CLASSES OF POULTRY	NUMBER	PERCENTAGE
Broilers	17	7.22
Fryers	142	60.43
Roasters	50	21.28
Stew hens	25	10.64
Capons	1	.43
Total replies	235	100.00

fryers. A very large percentage of the buyers indicated a preference for local poultry; 80.0 percent preferred island poultry whereas 8.9 percent preferred mainland chickens (table 5). The reasons for wanting mainland chickens were that such poultry was cheaper, cleaner, and easier to prepare. On the other hand, preference for island chickens was largely based on freshness, tenderness, and better flavor.

TABLE 5. Consumer preference for mainland and island chickens

	NUMBER	PERCENTAGE
Island poultry	188	80.00
Mainland	21	8.94
No preference	26	11.06
Total replies	235	100.00

Only 17.4 percent of the buyers purchased poultry one or more times a week, and 33.6 percent stated that they purchased poultry once in 2 weeks. Of the 235 persons who replied, 48.9 percent purchased poultry not more often than once a month (table 6). It would appear that there is a real opportunity for increased consumer acceptance of poultry through more effective merchandising and pricing. These data suggest that poultry meat falls in the category of luxury foods at the present time.

TABLE 6. Frequency of purchase by customers polled in this study

	NUMBER	PERCENTAGE
Once a week	41	17.45
Every 2 weeks	79	33.62
Once a month	80	34.04
Every 2 months	8	3.40
Irregular	27	11.49
Total replies	235	100.00

There was no clearly defined trend between size of family (number of adults) and age of market chicken, method of marketing, or frequency of purchase.

DISCUSSION

The consumers polled in this study (i.e., University of Hawaii faculty and employees) had a definite preference for processed chickens. Almost 75.0

percent of the buyers indicated their preference for either eviscerated or sectioned poultry. Very few persons had any desire either to dress and/or eviscerate chickens, and many indicated that they would rather not buy a chicken if it were undrawn. Among the factors conditioning this attitude may be the fact that many of the housewives have jobs and therefore have not the time to dress and draw chickens for weekday meals. Furthermore, the convenience of opening a transparent wrapper and having the carcass ready for the oven or barbecue grill appeals to modern homemakers.

This study suggests that the potential market for poultry can be greatly increased in Hawaii. As shown in table 6 nearly half the consumers indicated that they purchased poultry less than once in 2 weeks. This situation may be influenced in part by tradition; that is, by the frequency with which poultry was served at home and by a conditioned liking for poultry. Another important reason is the competition created by other kinds of meat and fish. A careful study of ways to reduce costs of production and marketing may therefore be in order so as to improve the demand for poultry as an everyday food.

It may be concluded from this study that the costs involved in eviscerating and/or sectioning chickens are not excessively high. Consequently, increased customer appeal may be gained by more frequent marketing of poultry either as eviscerated or sectioned chickens. An analysis of the costs of evisceration has shown, on a total cost basis, that the customer does not pay very much more for eviscerated or sectioned poultry than for live poultry. In table 7 may be seen a breakdown of the charges for the various methods of preparation of market poultry both for the lightest and heaviest birds studied in this investigation. For chickens averaging 4.11 pounds prior to slaughter the increased costs per pound for preparation and packaging were as follows: dressed, 8 cents; eviscerated, 23 cents; and sectioned, 28 cents. For chickens averaging 5.34 pounds live weight the increased costs per pound were as follows: dressed, 8 cents; eviscerated, 31 cents; and sectioned, 34 cents. When considered on this basis the costs of marketing appear excessively high. On the other hand consider the total charge for the later group. At 50 cents per pound the live birds would cost \$2.67; when dressed, \$2.80; when eviscerated and packaged, \$2.87; and when sectioned and packaged, \$2.93. Thus the convenience to the consumer costs him 13 cents for killing and dressing, 7 cents more for

TABLE 7. Costs incurred by the different methods of preparing chickens for market

SOLD AS	WEIGHT	VALUE PER POUND OF CARCASS	LABOR CHARGE PER POUND	COST OF WRAPPER PER POUND	CHARGE PER POUND	COST OF CARCASS TO CONSUMER
	<i>pounds</i>	<i>cents</i>	<i>cents</i>	<i>cents</i>	<i>cents</i>	<i>dollars</i>
Alive	4.11	50.0	0.0	....	50.0	2.05
Dressed	3.76	54.8	2.9	....	58.0	2.18
Eviscerated	3.13	65.6	5.6	0.9	72.1	2.26
Cut up	3.01	68.4	7.9	0.9	77.2	2.32
Alive	5.34	50.0*	0.0	....	50.0	2.67
Dressed	4.83	55.3	2.3	....	58.0	2.80
Eviscerated	3.58	74.6	4.9	0.8	80.3	2.87
Cut up	3.51	76.0	6.8	0.8	83.6	2.93

* Wholesale market quotation in Honolulu on April 27, 1950.

eviscerating and packaging, and an additional 6 cents for eviscerating, sectioning, and packaging a chicken. In this study the modern homemaker has indicated a preference for the convenience of ready-to-cook chicken at a small additional charge.

It was observed in this study that, on the average, one man could slaughter, dress, eviscerate, and package a chicken in 10.5 minutes. Thus, using methods employed locally, one man could process approximately six birds per hour. Since Benjamin *et al.* (1) have reported that 125 to 150 persons are needed during a typical 8-hour day to dress, plant-draw, and individually pack 1,000 birds per hour, it can be estimated that one man could handle approximately seven birds per hour. These facts suggest the possibility of reducing the price of drawn birds by utilizing more efficient equipment. This might be accomplished through the erection of cooperative killing and dressing stations to which individual producers may bring their birds to be processed.

It is realized that our questionnaire was not answered by the typical consumer living in Honolulu. A study of this kind should be undertaken so that more definite data on consumer preference can be made available. The conclusions drawn from this study on consumer preference are suggestive and are typical only for a comparable group of people. The data on shrinkage due to dressing, eviscerating, and sectioning, as well as labor required for each procedure, on the other hand, may be applied to the Territory as a whole.

CONCLUSIONS

1. Based on a study of 562 chickens ranging in body weight from 4.11 to 5.34 pounds per bird, the average dressing loss was 9.3 percent of total body weight.

2. The ~~percentage of live weight lost~~ through evisceration varied in accordance with body weight, the lightest group losing 23.9 percent and the heaviest group losing 33.0 percent.

3. The percentage lost due to sectioning was a little higher than for evisceration. In the group averaging 5.3 pounds live weight the additional loss due to sectioning was 1.3 percent.

4. Using local methods of dressing and drawing chickens, it was observed that one man, on the average, required 6.7 minutes to dress; 10.5 minutes to dress, eviscerate, and package; and 14.2 minutes to dress, eviscerate, section, and package the experimental birds.

5. The consumers polled in this study (i.e., University of Hawaii faculty and employees) had a definite preference for processed chickens. Of 305 chickens sold, 25.6 percent were New York dressed, 49.5 percent were eviscerated and packaged, and 24.9 percent were sectioned and packaged. The price differential per pound was based on dressing loss, labor, and cost of the transparent wrapper.

6. Two hundred and thirty-five questionnaires were answered. Of these 88.9 percent declared a preference for young market birds. The predominant preference was for fryers. Furthermore, 80.0 percent categorically preferred island chickens.

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Avg dressed loss
evisceration loss
New York dress

7. Of the 235 persons who replied, 48.9 percent purchased poultry not more often than once a month. It would appear that there is a real opportunity for increased consumer acceptance of poultry through more effective merchandising and pricing.

8. At 50 cents per pound live weight, birds averaging 5.34 pounds would cost \$2.67; when dressed, \$2.80; when eviscerated and packaged, \$2.87; and when sectioned and packaged, \$2.93. Thus the convenience to the consumer would cost him 13 cents for killing and dressing, 7 cents more for eviscerating and packaging in a transparent wrapper, and an additional 6 cents for eviscerating, sectioning, and packaging when processed according to local methods.

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